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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/515,807	02/29/2000	Richard B Merrill	FOV-036	1008

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EXAMINER
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YE, LIN

ART UNIT	PAPER NUMBER
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2612

DATE MAILED: 11/10/2003

19

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/515,807

Applicant(s)

MERRILL ET AL.

Examiner

Lin Ye

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 February 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,5,6,7,8
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-49 are rejected under 35 U.S.C. 102(e) as being anticipated by Wu et al. U.S. Patent 6,111,245.

Referring to claim 1, the Wu reference discloses in Figures 2-3 and 5, a storage pixel sensor disposed on a semiconductor substrate comprising: a photodiode (D2) having a first terminal coupled to a first potential and a second terminal; a reset transistor (M2 in Figure 3) having a first terminal coupled to the second terminal of the photodiode, a second terminal coupled to a reset reference potential that reverse biases the photodiode (See Col. 2, lines 19-23), and a control gate coupled to a RESET signal node; a photocharge integration node (point b in Figure 3) coupled to said first terminal of said reset transistor (M2), said photocharge integration node comprising the control gate of a source follower transistor (M3), said source-follower transistor having a drain, coupled to a source follower drain supply voltage node, and a source coupled to means for generating a bias current (bias transistor M5); and a capacitive storage node (point C in Figure 5), coupled to the source of

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the source-follower transistor (M3 in Figure 3), comprising the input of a readout amplifier transistor having an output as shown in Figure 3.

Referring to claim 2, the Wu reference discloses including means for selectively pulsing (VDD signal) said source-follower drain supply voltage node.

Referring to claim 3, the Wu reference discloses wherein said readout amplifier (M1 in Figure 5) is a second source-follower transistor having a drain coupled to a second source-follower drain supply voltage (VSS in Figure 5) node and said capacitive storage node (point c) is a gate associated therewith.

Referring to claim 4, the Wu reference discloses wherein further coupled to means for selectively pulsing (VDD signal in Figure 5) said second source-follower drain supply voltage.

Referring to claim 5, the Wu reference discloses wherein said means for generating a bias current comprises a bias transistor (bias transistor M5 in Figure 3) having a source coupled to a fixed voltage source, a gate coupled to a bias voltage (Vb) node and a drain coupled to the source of said source follower transistor (M3 in Figure 3).

Referring to claim 6, the Wu reference discloses wherein the gate of said bias transistor (M5 in Figure 3) is coupled to a bias voltage (Vb) node that may be selectively pulsed (Vb signal).

Referring to claim 7, the Wu reference discloses wherein further including a barrier transistor (M1 in Figure 3) having first and second terminals coupled between the second terminal of the photodiode (D2 in Figure 3) and said first terminal of said reset transistor (M2

in Figure 3), said barrier transistor having a control terminal (Shutter in Figure 3) coupled to a barrier set voltage (see Col. 2, lines 60-65).

Referring to claim 8, the Wu reference discloses wherein said reset transistor (M2 in Figure 3) and said barrier transistor (M1 in Figure 3) are sized so as to have substantially matched voltage thresholds (See Col. 3, lines 1-22).

Referring to claim 9, the Wu reference discloses wherein a transfer transistor disposed between said source of said source-follower transistor (M3 in Figure 3) and the capacitive storage node (point c), said transfer transistor (having a first terminal coupled to said source of said source-follower transistor, a second terminal coupled to the capacitive storage node and a control gate coupled to a XFR signal ( $\Phi 1$  signal) node (See Col. 3, lines 46-51).

Referring to claim 10, the Wu reference discloses wherein row-select transistor (M2 in Figure 5) having a first terminal coupled to the output of the readout amplifier (M1 in Figure 5), a second terminal coupled to a column output line (Vout line) and a control gate coupled to a ROW SELECT signal (Ysel signal used to output the signal on same line) node; and a control circuit (row decoder 22 and column decoder 23 in Figure 2) for selectively activating a RESET signal (CK, M4 and M5 are commonly used by many lines for providing a reset voltage in Figure 5) on said RESET signal node, a XFR signal ( $\Phi 1$  signal) on said XFR signal node, and a ROW SELECT (Ysel) signal on said ROW SELECT signal node as shown in Figure 6 (See Col.3, lines 30-62).

Referring to claim 11, the Wu reference discloses wherein an exposure transistor (M4 in Figure 3) having a source coupled to said output of said source-follower transistor (M3) and drain coupled to a global current-summing node (VDD in Figure 3), said exposure transistor

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having a control gate coupled to a saturation level (WL signal) control voltage (See Col. 2, lines 40-44).

Referring to claim 12, the Wu reference discloses all subject matter as discussed with respected to same comment as with claims 1 and 7.

Referring to claim 13, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 2.

Referring to claim 14, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 3.

Referring to claim 15, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 4.

Referring to claim 16, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 5.

Referring to claim 17, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 6.

Referring to claim 18, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 8.

Referring to claim 19, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 9.

Referring to claim 20, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 10.

Referring to claim 21, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 11.

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Referring to claim 22, the Wu reference discloses all subject matter as discussed with respected to same comment as with claims 1 and 11.

Referring to claim 23, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 2.

Referring to claim 24, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 3.

Referring to claim 25, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 4.

Referring to claim 26, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 5.

Referring to claim 27, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 6.

Referring to claim 28, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 8.

Referring to claim 29, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 9.

Referring to claim 30, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 10.

Referring to claim 31, the Wu reference discloses all subject matter as discussed with respected to same comment as with claims 1 and 9.

Referring to claim 32, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 2.

Referring to claim 33, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 3.

Referring to claim 34, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 4.

Referring to claim 35, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 5.

Referring to claim 36, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 6.

Referring to claim 37, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 8.

Referring to claim 38, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 10.

Referring to claim 39, the Wu reference discloses all subject matter as discussed with respected to same comment as with claims 1 AND 11.

Referring to claim 40, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 2.

Referring to claim 41, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 5.

Referring to claim 42, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 6.

Referring to claim 43, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 7.



Referring to claim 44, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 8.

Referring to claim 45, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 1.

Referring to claim 46, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 3.

Referring to claim 47, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 4.

Referring to claim 48, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 9.

Referring to claim 49, the Wu reference discloses all subject matter as discussed with respected to same comment as with claim 10.

### *Conclusion*

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
  - a. Bailey U.S. 6,317,154 discloses a storage pixel sensor has a transfer transistor (M12) disposed between a source-follower transistor (M13) and the capacitive storage node (D).
  - b. Merrill et al. U.S. 5,962,844 discloses a storage pixel sensor has a row-select transistor (18) having first terminal coupled to a output of a readout amplifier (16), a

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second terminal coupled to a column output line and a control gate coupled to a ROW  
SELECT signal node.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Lin Ye** whose telephone number is **(703) 305-3250**. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy R Garber can be reached on (703) 305-4929.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

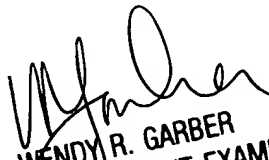
Washington, DC. 20231

Or faxed to:

(703) 872-9314

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal drive,  
Arlington, VA., Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

  
WENDY R. GARBER  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600

Lin Ye  
October 28, 2003